

# SAFETY DATA SHEET

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

**Product Identifier** 

SRM Number: 2644a

**SRM Name:** Propane in Nitrogen (Nominal Amount-of-Substance Fraction 250 µmol/mol)

Other Means of Identification: Not applicable.

#### Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is a primary gas mixture of propane in nitrogen provided as a compressed gas in a DOT 3AL-specification aluminum (6061 alloy) cylinder equipped with a CGA-350 brass valve at a nominal pressure of 11.0 MPa (1600 psi). NIST recommends that this cylinder **NOT** be used below 0.7 MPa (100 psi).

#### **Company Information**

National Institute of Standards and Technology Standard Reference Materials Program 100 Bureau Drive, Stop 2300 Gaithersburg, Maryland 20899-2300

 Telephone: 301-975-2200
 Emergency Telephone ChemTrec:

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#### 2. HAZARDS IDENTIFICATION

Classification

**Physical Hazard:** Compressed Gas. **Health Hazard:** Simple Asphyxiant.

# Label Elements Symbol



Signal Word WARNING

#### **Hazard Statement(s)**

H280 Contains gas under pressure; may explode if heated.

----- May displace oxygen and cause rapid suffocation.

# **Precautionary Statement(s)**

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Hazards Not Otherwise Classified: Not applicable.

**Ingredients(s) with Unknown Acute Toxicity:** Not applicable.

# 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Propane in nitrogen, compressed gas

# Other Designations:

Propane: dimethylmethane; propyl hydride; C<sub>3</sub>H<sub>8</sub>. Nitrogen: Dinitrogen, nitrogen compressed.

SRM 2644a Page 1 of 6

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the NIST Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Nitrogen	7727-37-9	231-783-9	>99
Propane	74-98-6	200-827-9	< 0.03

# 4. FIRST AID MEASURES

# **Description of First Aid Measures:**

**Inhalation:** If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed.

**Eye Contact:** Immediately flush eyes, including under the eyelids with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

**Ingestion:** Ingestion of a gas is unlikely. As this product is a gas, refer to the inhalation section.

Most Important Symptoms/Effects, Acute and Delayed: Harmful if inhaled, blood damage, difficulty breathing, and suffocation.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If any of the above symptoms are present, seek immediate medical attention.

## 5. FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** Negligible fire hazard applicable to the identified NIST cylinder. Cylinders may rupture or explode if exposed to heat. See Section 9, "Physical and Chemical Properties" for flammability properties.

### **Extinguishing Media:**

Suitable: Use extinguishing media appropriate to the surrounding fire.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Oxides of nitrogen, oxides of carbon.

**Special Protective Equipment and Precautions for Fire-Fighters:** Move cylinder from fire area if it can be done without personal risk. Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 0 Reactivity = 0

#### 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions, Protective Equipment and Emergency Procedures:** Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection". Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

**Methods and Materials for Containment and Clean up:** Stop leak if possible without personal risk. Isolate hazard area and deny entry. Stay upwind and keep out of low areas.

#### 7. HANDLING AND STORAGE

**Safe Handling Precautions:** Use only with adequate ventilation. Do not puncture or incinerate container. Close valve after each use and when empty. Keep valve protection cap on cylinder when not in use.

**Storage:** Store and handling in accordance with all current regulations and standards. Secure cylinder to prevent physical damage. Keep separated from incompatible substances (see Section 10, "Stability and Reactivity"). Store in well-ventilated area. Subject to storage regulations, OSHA 29 CFR 1910.101.

SRM 2644a Page 2 of 6

# 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits					
Components	OSHA (PEL)	ACGIH (TLV)	NIOSH (REL)		
Nitrogen	No occupational exposure limits	Simple asphyxiant	No occupational exposure limits		
Propane	TWA: 1800 mg/m <sup>3</sup> (1000 ppm)	TWA: 1000 ppm	TWA: 1800 mg/m <sup>3</sup> (1000 ppm)		
			IDLH: 2100 ppm (10 % LEL)		
			Ceiling: 229 mg/m <sup>3</sup> (200 ppm)		

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29 CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear safety goggles. An eye wash station should be readily available near areas of use.

**Skin and Body Protection:** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Reactivity:** Stable at normal temperature and pressure.

Possible Hazardous Reactions: None listed.

Stable

Stability: X

<b>Descriptive Properties</b>	Nitrogen (>99 %)	Propane (<0.03 %)		
Appearance (physical state, color, etc.)	colorless compressed gas	colorless compressed gas		
Molecular Formula	N <sub>2</sub>	C <sub>3</sub> H <sub>8</sub>		
Molar Mass (g/mol)	28	44.11		
Odor	odorless	distinct odor		
Odor threshold	not available	5 000 ppm to 20 000 ppm		
рН	not applicable	not available		
Evaporation rate	not applicable	not available		
Melting point/freezing point	−210 °C (−346 °F)	−190 °C (−310 °F)		
Relative Density	1.2506 g/L	0.5853 at -45 °C (specific gravity)		
Vapor Pressure (mmHg)	760 at −196 °C	6536 at 20 °C		
Vapor Density (air = 1)	0.967	1.55		
Viscosity (cP)	0.01787 at 27 °C	not available		
Solubility(ies)	water, 1.6 % at 20 °C; liquid ammonia	water, very slightly soluble; soluble in absolute alcohol, ether		
	1	benzene, turpentine		
Partition coefficient (n-octanol/water)	not available	not available		
Thermal Stability Properties				
Autoignition Temperature	not applicable	450 °C (842 °F)		
Thermal Decomposition	not applicable	not available		
Initial boiling point and boiling range	−196 °C (−321 °F)	not available		
Explosive Limits, LEL	not applicable	2.1 %		
Explosive Limits, UEL	not applicable	9.5 %		
Flash Point	not applicable	−105 °C (−157 °F)		
Flammability (solid, gas)	not applicable	not available		
10. STABILITY AND REACTIVITY				

SRM 2644a Page 3 of 6

Unstable

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat. **Incompatible Materials:** Oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium. **Fire/Explosion Information:** See Section 5, "Fire Fighting Measures". **Hazardous Decomposition:** Miscellaneous decomposition products. **Hazardous Polymerization:** Will Occur X Will Not Occur 11. TOXICOLOGICAL INFORMATION **Route of Exposure:** X Inhalation Skin Ingestion Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, disorientation, emotional disturbances, pain in extremities, tremors, loss of coordination, hearing loss, and visual disturbances. Potential Health Effects (Acute, Chronic and Delayed) Inhalation: Nitrogen compressed gas is a simple asphyxiant. Release in an enclosed space may result in asphyxiation. The symptoms of asphyxia depend on the rapidity with which the oxygen deficiency develops and how long it continues. In sudden acute asphyxia, unconsciousness may be immediate. With slow development, there may be rapid respiration and pulse, air hunger, dizziness, reduced awareness, tightness in the head, tingling sensations, incoordination, faulty judgment, emotional instability, and rapid fatigue. As the asphyxia progresses, nausea, vomiting, collapse, unconsciousness, convulsions, deep coma, and death are possible. Propane may cause slight dizziness. **Skin Contact:** No information on significant adverse effects. **Eve Contact:** Exposure may result in irritation, blurred vision. Ingestion: Ingestion of a gas is unlikely under normal conditions of use. As this product is a gas, refer to the inhalation section. **Numerical Measures of Toxicity** Acute Toxicity: Not classified, concentration of propane is below cut off value of 1 %. Propane; Rat, Inhalation LC50: 658 mg/L (4 h) Nitrogen; Simple asphyxiant Skin Corrosion/Irritation: Not applicable. Serious Eye damage/ Eye irritation: Not applicable. Respiratory Sensitization: No data available. Skin Sensitization: No data available. Germ Cell Mutagenicity: Not classified. Carcinogenicity: Not classified. \_\_\_ Yes Listed as a Carcinogen/Potential Carcinogen Nitrogen and propane are not listed by NTP, IARC or OSHA as a carcinogen/potential carcinogen. **Reproductive Toxicity:** Not classified; concentration of propane is below cut off value of 0.1 %. Specific Target Organ Toxicity, Single Exposure: Not classified. Specific Target Organ Toxicity, Repeated Exposure: Not classified. **Aspiration Hazard:** No data available. 12. ECOLOGICAL INFORMATION Ecotoxicity Data: No data available. Persistence and Degradability: No data available.

Other Adverse effects: No data available.

**Mobility in Soil:** No data available.

Bioaccumulative Potential: No data available.

SRM 2644a Page 4 of 6

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal:** Dispose of waste in accordance with all applicable federal, state, and local regulations. Propane subject to disposal regulations, U.S. EPA 40 CFR 262, Hazardous Waste Number: D001.

## 14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1956; Compressed gas, n.o.s. (Propane in nitrogen); Hazard Class 2.2.

#### 15. REGULATORY INFORMATION

#### **U.S. Regulations:**

CERCLA Sections 102a/103 (40 CFR 302.4): Identified cylinder not regulated.

SARA Title III Section 302 (40 CFR 355.30): Identified cylinder not regulated.

SARA Title III Section 304 (40 CFR 355.40): Identified cylinder not regulated.

SARA Title III Section 313 (40 CFR 372.65): Identified cylinder not regulated.

OSHA Process Safety (29 CFR 1910.119): Identified cylinder not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: Yes.
CHRONIC HEALTH: No.
FIRE: No.
REACTIVE: No.
PRESSURE: Yes.

#### **State Regulations:**

California Proposition 65: No components are listed.

**U.S. TSCA Inventory:** Propane and nitrogen are listed.

TSCA 12(b), Export Notification: No components are listed.

Canadian Regulations: WHMIS Information is not provided for this material.

SRM 2644a Page 5 of 6

## 16. OTHER INFORMATION

Issue Date: 25 July 2014

Sources: ChemADVISOR, Inc., SDS, Nitrogen, Compressed Gas, 19 June 2014.

ChemADVISOR, Inc., SDS, Propane, 19 June 2014.

#### **Key of Acronyms:**

ACGIH	American Conference of Governmental Industrial	NRC	Nuclear Regulatory Commission
	Hygienists		
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response,	PEL	Permissible Exposure Limit
	Compensation, and Liability Act		
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical	RQ	Reportable Quantity
	Substances		
EPCRA	Emergency Planning and Community Right-to-Know	RTECS	Registry of Toxic Effects of Chemical Substances
	Act		
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System
n.o.s.	Not Otherwise Specified		

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.

SRM 2644a Page 6 of 6